ATTACHMENT 10

DUAL-SIDED LCD PASSENGER INFORMATION SCREEN

FOR

PROCUREMENT OF 40 FT LOW-FLOOR BATTERY ELECTRIC BUSES

SPECIFICATION NO. VE21-054

Massachusetts Bay Transportation Authority
Vehicle Engineering
Boston, Massachusetts

A. Background

If awarded, the Contractor shall provide, install, and fully integrate, on two pilot buses and eight production buses (ten buses in total), a dual-sided LCD passenger information screen that allow for display of real-time passenger information and advertising per the requirements. If awarded, this option will be incorporated into the Design Review Process during the Initial Design Review Meeting and configuration validation shall be included in Pilot bus test procedures. (TS 4.5; TS Attachment 2)

The location and brightness of the sign shall automatically adjust to provide good readability under all normal lighting conditions and minimize windshield glare.

1. Scope and Classification

1.1 Interior LCD Displays Pilot

Dual-sided LCD passenger information screens shall be provided that allow for display of real-time passenger information and advertising. Such screens shall have the following capabilities & minimum specifications.

2.1 Capabilities

The LCD screens and shall be able to display real-time transit service information, advertising, or both. It shall draw from online and/or on-board data sources, and be configurable via a Content Management System (CMS). It shall also be able to display a URL provided by the MBTA, allowing the MBTA to drive content in-house.

1. **Real-time transit service information:**
   - A. The real-time transit service information shall include:
     1. Next stop, including stop name, connecting services, accessibility indicator
     2. Stop request indicator
     3. Route destination
     4. Information to orient customers, such as next several stops, or vehicle position on a map
     5. Relevant service alerts
     6. Badge number of operator driving bus
   - B. The real-time transit service information shall pull from data sources outlined in “data sources,” below.
   - C. The screens and associated CMS shall allow the MBTA to configure what information is displayed, and how.
   - D. The screens shall display this real-time transit service information from existing data sources, without the need for active involvement from any MBTA employee. For example, it shall be able to display service alerts pulled from existing data sources such as the V3 API, without requiring that service alerts be formatted as images and uploaded using the CMS.

2. Advertising:

A. Advertising shall be configurable using the CMS.

B. Advertising can be configured to display under certain conditions using criteria such as route id, time of day, or geofencing.

C. The screens shall maintain records of the display of the advertising, which shall be easily retrievable by the MBTA to demonstrate to advertisers that their ads were shown.

3. Data sources:

A. The real-time transit service information shall pull from data sources such as:

1. The MBTA's V3 API and/or GTFS and GTFS-realtime feeds, documented at mbta.com/developers, accessed over cellular. Note that some inputs necessary for the required capabilities, such as service alerts, are only available from these data sources. Note that while vehicle latitude/longitude and next stop are available from these data sources, the latency with which they are available is considered to be too great to effectively drive the features above.
2. On-board data broadcast to the canbus by other on-board systems such as the Vontas TransitMaster IVLU. The screen vendor may leverage information that is already broadcast, or may work with other component suppliers to broadcast new information. The vendor will provide full documentation on the format, content, and expected behavior of any canbus data used by the screens. Note that some inputs necessary for the required capabilities, such as stop request status, are only available from this data source.
3. On-board data collected by the screen hardware, such as if it were to include its own GPS antenna.

B. Advertising shall be configurable using a CMS.

3.1 CMS and configuration:

A. The screens and associated CMS shall allow the MBTA to configure what real-time transit information is displayed, and how.

B. Advertising shall be configurable using CMS.

C. The relationship of real-time information and advertising on the display shall be configurable using the CMS. For example the MBTA may opt to display real-time information and advertising side-by-side.

4.1 Display a URL:

A. The screens shall be configurable to display a URL provided by the MBTA.

B. The MBTA may choose to use this feature to take over part or all of the above-specified functionality in the future. For example, the MBTA may decide to use this feature to drive the display of advertising instead of using the CMS, or the MBTA may decide to use this feature to drive the entire display and use its own passenger information logic. This URL can be used to drive part of the display or the entire display accordingly.

5.1 Other features:

A. The screens shall monitor themselves for performance problems or signs of defects, and the MBTA shall be notified of problems that might require maintenance.

6.1 Physical properties

A. Hardware specifications

4. Screen technology: LCD with LED backlight
5. Orientation: portrait
6. Aspect ratio: 32:9 (9:32 in portrait orientation)
7. Size: the live area of the screen shall be maximized for viewing from all seated areas
8. Brightness: >=500 cd/m2 with ambient light sensing capability
9. Power supply: must run on standard 24V DC
10. Viewing angle: >=89° from all sides
11. Operating temperature range: at least 0°C-50°C
12. Protection: minimum rating of IP55

7.1 Mounting specifications

A. Overhead, facing directly forwards and backwards, without interfering with ADA clearance requirements

B. The Contractor shall perform a viewing angle analysis for all seated positions and secured mobility device locations, and shall perform a glare/reflection study, and submit for review as part of CDR 14.

8.1 Software & connectivity capabilities

A. The CMS for the LCD screens shall be fully web-based and shall allow the MBTA to make "over the air" updates to any content layouts, playlists, or parameters

B. The LCD screens' control system shall be capable of taking inputs from both on-vehicle hardware and web-based endpoints as described in the capabilities section above.